

REMARKS

Claims 2-8, 11-19, 21-27, 32-37 and 41-43 are pending in the application.

Claims 2-8, 11-19 and 21-26 are objected to.

Claims 2-8, 11-19, 21-27, 32-37 and 41-43 are rejected under 35 U.S.C. 103(a).

Applicants request reconsideration and allowance of the claims in light of the above amendments and following remarks.

Claim Objections

Claims 2-8, 11-19 and 21-26 are objected to because the claims “have independent claim numbers that are larger than some dependent claim numbers.” For reasons presented at page 9, lines 17-28 of Applicants’ response filed April 16, 2007, the fact that certain claims “have independent claim numbers ... [which] are larger than some dependent claim numbers” is not an informality. Absent any evidentiary basis that claims cannot be amended to depend from other claims with larger claim numbers, Applicants respectfully request withdrawal of the present objection to the claims.

Claim Rejections – 35 U.S.C. § 103

Claims 2-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,132,512 issued to Horie et al. (hereinafter “Horie”). Applicants respectfully traverse this rejection.

Rejecting claim 8, the Office Action acknowledges that Horie: a) does not teach wherein the heating liquid medium passages B and B' are arranged within the lower one of the disks 31 and 32; b) does not teach wherein the liquid passage inlet ports 25b1,b2,b3 are arranged outside the lower one of the disks 31 and 32; c) does not teach wherein each liquid passage inlet port 25b1,b2,b3 is connected to only one heating liquid medium passage B and B'; d) does not teach wherein the liquid passage outlet ports 25c1,c2,c3 are arranged outside the lower one of the disks 31 and 32; and e) does not teach wherein each liquid passage outlet port 25c1,c2,c3 is connected to only one heating liquid medium passage B and B'. Nevertheless, the Office Action asserts that it would have been obvious to “reproduce Horie’s coolant inlet and coolant outlet part at optimized relative positions... to optimize heat transfer of Horie’s showerhead.” Applicants respectfully disagree.

To reject a claim because some teaching, suggestion, or motivation in the prior art would have led one of ordinary skill to modify the prior art reference to arrive at the claimed invention, the Office must articulate, among other elements, a finding that there was some teaching, suggestion, or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. See M.P.E.P. 2143(G).

In the present case, Horie is completely silent as to any teaching or suggestion supporting a determination that connecting each liquid passage inlet port 25b1,b2,b3 and each liquid passage outlet port 25c1,c2,c3 to only one heating liquid medium passage B or B' will “optimize heat transfer” of the gas ejection head 5 of Horie. Moreover, the Office Action identifies no basis in fact or technical reasoning which reasonably supports a determination that heat transfer of the gas ejection head 5 of Horie can be “optimized” simply by connecting each liquid passage inlet port 25b1,b2,b3 and each liquid passage outlet port 25c1,c2,c3 to only one heating liquid medium passage B or B'. Further, the Office Action identifies no knowledge within the level of ordinary skill in the art indicating that one of ordinary skill, seeking to “optimize heat transfer” of the gas ejection head 5 of Horie, would do so simply by connecting each liquid passage inlet port 25b1,b2,b3 and each liquid passage outlet port 25c1,c2,c3 to only one heating liquid medium passage B or B'.

In view of the above, the Office Action fails to articulate a finding that there is any teaching, suggestion, or motivation, either in Horie or in the knowledge generally available to one of ordinary skill in the art, to modify Horie by connecting each liquid passage inlet port 25b1,b2,b3 and each liquid passage outlet port 25c1,c2,c3 to only one heating liquid medium passage B or B' to “optimize heat transfer” of the gas ejection head 5 of Horie. Accordingly, the Office Action fails to establish that one of ordinary skill in the art would have found it “obvious” to modify Horie in a manner that reads on features recited in claim 8.

Moreover, and absent any evidence to the contrary, it appears as though the only source of motivation to modify Horie as proposed by the Office Action is by Applicants' claim 8, via impermissible hindsight reasoning. For at least this additional reason, the Office Action fails to establish a *prima facie* of obviousness for claim 8.

Further rejecting claim 8, the Office Action appears to assert that it would have been obvious to “reproduce Horie's coolant inlet and coolant outlet part at optimized relative positions” because “it is well established that duplication of parts is obvious.” In view of the

aforementioned assertion in the Office Action, it appears as though the Office Action proposes “duplicating” the liquid passage inlet ports 25b1,b2,b3 and liquid passage outlet ports 25c1,c2,c3 included in the nozzle head body 20 to be equal to the number of heating liquid medium passages B and B' included in the nozzle head body 20. According to such a modification, however, each liquid passage inlet port 25b1,b2,b3 and each liquid passage outlet port 25c1,c2,c3 will still be connected to more than one heating liquid medium passage B and B' due to the presence of the heating liquid medium passage D extending around the heating liquid medium passages B and B'. Therefore, even if Horie is modified by duplicating the liquid passage inlet ports 25b1,b2,b3 and liquid passage outlet ports 25c1,c2,c3 included in the nozzle head body 20, the modified structure of Horie still does not render claim 8 obvious.

Further rejecting claim 8, the Office Action appears to assert that it would have been obvious to “reproduce Horie’s coolant inlet and coolant outlet part at optimized relative positions” because, citing *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), “changes in apparatus dimensions are within the level of ordinary skill in the art.” This is not the precedent established by *Gardner v. TEC Systems*. Rather, and as also acknowledged in the M.P.E.P. § 2144.04(IV)(A), the court held in *Gardner v. TEC Systems* that, “where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device *and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.*” (*emphasis added*)

As mentioned above, the nozzle head body 20 of Horie includes a heating liquid medium passage D extending around the heating liquid medium passages B and B'. Therefore, heating liquid medium introduced into the nozzle head body 20 via the liquid passage inlet port 25b1 passes through the nozzle head body 20 via the liquid medium passages B' and exists the nozzle head body 20 via the liquid passage outlet port 25c3. Similarly, heating liquid medium introduced into the nozzle head body 20 via the liquid passage inlet port 25b3 passes through the nozzle head body 20 via the liquid medium passages B and exists the nozzle head body 20 via the liquid passage outlet port 25c1. However, heating liquid medium introduced into the nozzle head body 20 via the liquid passage inlet port 25b2 passes through the nozzle head body 20 via the liquid medium passages B or B' and exists the nozzle head body 20 via the liquid passage

outlet ports 25c1, 25c2 or 25c3 upon being redirected within sections D4 and D8 of the heating liquid medium passage D.

If one of ordinary skill in the art were to somehow change the dimensions of the various components in the nozzle head body 20 of Horie such that each liquid passage inlet port 25b1,b2,b3 and each liquid passage outlet port 25c1,c2,c3 is connected to only one heating liquid medium passage B or B', then the resultant nozzle head body 20 of Horie would perform differently from the resultant nozzle head body 20 actually shown in FIG. 10 of Horie because the functionality of sections D4 and D8 of the heating liquid medium passage D is completely eliminated. Because the nozzle head body 20 of Horie, when modified as proposed by the Office Action, would perform differently from the resultant nozzle head body 20 actually shown in FIG. 10 of Horie, one of ordinary skill in the art would not find it "obvious" to simply change the dimensions of the various components in the nozzle head body 20 of Horie such that each liquid passage inlet port 25b1,b2,b3 and each liquid passage outlet port 25c1,c2,c3 is connected to only one heating liquid medium passage B or B'. See *Gardner v. TEC Systems*. See also M.P.E.P. § 2143.01(VI).

Claims 2-7 depend from claim 8 and, therefore, include all of the elements recited in claim 8. Accordingly, Horie fails to render claims 2-7 obvious at least by virtue of their dependence from claim 8.

Claims 11-19, 21-27, 32-37 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horie in view of U.S. Patent No. 6,544,380 issued to Tomoyasu et al (hereinafter "Tomoyasu"). Applicants respectfully traverse this rejection.

Rejecting claim 19, the Office Action then asserts that Tomoyasu teaches "a separating device (527...) ... disposed beneath a heater stage (526...), [wherein] a lower surface of the separating device (527...) [is] disposed in contact with the bottom wall (546...), [and wherein] the separating device (527...) [is] configured to separate the heater stage (526...) from the bottom wall (546...)...."

Applicants respectfully submit, however, that the "separating device 527" of Tomoyasu (i.e., a heat insulating wall) is not disposed beneath the "heater stage 526", is not disposed in contact with the "bottom wall 546" (i.e., a support plate) and is not configured to separate the heater 526 from the support plate 546. As is clearly shown in FIG. 18, the heat insulating wall

527 is disposed laterally adjacent to the heater 526 and a wafer-mounted stage 525. As is also clearly shown in FIG. 18, the heat insulating wall 527 is disposed in contact with a bottom plate 521. Because the heat insulating wall 527 of Tomoyasu is disposed laterally adjacent to the heater 526 and a wafer-mounted stage 525, and is also disposed in contact with a bottom plate 521, Applicants respectfully submit that Tomoyasu cannot teach wherein the heat insulating wall 527 is disposed beneath the heater 526, in contact with the support plate 546, and be configured to separate the heater 526 from the support plate 546. For at least these reasons, Applicants respectfully submit that the combination of Horie in view of Tomoyasu fails to teach or suggest each and every element recited in claim 19 and, therefore, fails to render claim 19 obvious. See M.P.E.P. § 2143.03.

In the “Response to Arguments” section, the current Office Action appears to assert that the arguments presented at page 12, lines 10-19 of Applicants’ response filed April 16, 2007 (hereinafter “Applicants’ previous response”), which traverse the rejection of claim 19, are unpersuasive because “motivation to replace Horie’s lifting mechanism (17,18...) with Tomoyasu’s lifting mechanism (544,547...) and adding Tomoyasu’s cooling system (521...) is for influencing wafer temperature control...” However, the arguments presented at page 12, lines 10-19 of Applicants’ previous response did not dispute the alleged obviousness of replacing “Horie’s lifting mechanism (17,18...) with Tomoyasu’s lifting mechanism (544,547...) and adding Tomoyasu’s cooling system (521...)”. Rather, the aforementioned arguments of Applicants’ previous response asserted that “the Office Action identifies no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Horie using the heat insulating wall 527 of Tomoyasu in a manner that arrives at the structure recited in claim 19.” The insulating wall 527 of Tomoyasu is not a part of either the “lifting mechanism 544,547” nor the “cooling system 521” of Tomoyasu. Thus, arguments alleging the obviousness of replacing “Horie’s lifting mechanism (17,18...) with Tomoyasu’s lifting mechanism (544,547...) and adding Tomoyasu’s cooling system (521...)” do not answer the substance of arguments pointing out that the Office Action fails to identify any suggestion or motivation to modify Horie using the heat insulating wall 527 of Tomoyasu in a manner that arrives at the structure recited in claim 19 (i.e., in a manner that suggests the obviousness of modifying Horie such that the that the unnumbered item shown in FIG. 7 of Horie, immediately above item 17, is “configured to separate the heater stage (3,4...)”).

from the bottom wall (17...) and to reduce a volume of processing space within the process chamber (1...)). If the current rejection of claim 19 is to be maintained, Applicants respectfully request the substance of this argument be answered. Otherwise, Applicants request withdrawal of the current rejection of claim 19. See M.P.E.P. § 707.07(f).

Applicants further note that the arguments presented at page 12, line 20-page 13, line 4 of Applicants' previous response were not answered, let alone addressed. If the current rejection of claim 19 is to be maintained, Applicants respectfully request the substance of this argument be addressed and answered. Otherwise, Applicants request withdrawal of the current rejection of claim 19. See M.P.E.P. § 707.07(f).

Claims 11-18 depend from claim 19 and, therefore, include all of the elements recited in claim 19. Accordingly, the combination of Horie in view of Tomoyasu fails to render claims 11-18 obvious at least by virtue of their dependence from claim 19.

In the "Response to Arguments" section, the current Office Action appears to assert that the arguments presented at page 13, lines 9-21 of Applicants' previous response (traversing the rejection of claim 11) are unpersuasive because "drawings can be used as prior art," "[d]rawings and pictures can anticipate claims if they clearly show the structure which is claimed," and "the picture must show all the claimed structural features and how they are put together."

Nevertheless, the aforementioned arguments traversing the rejection of claim 11 asserted that "FIG. 7 of Horie does not illustrate wherein the [the unnumbered item shown in FIG. 7 of Horie, immediately above table 17] is disposed directly vertically beneath the substrate holder 3." Thus, the drawings of Horie do not show the structure as recited in claim 11. If the current rejection of claim 11 is to be maintained, Applicants respectfully request the substance of this argument be answered. Otherwise, Applicants request withdrawal of the current rejection of claim 11. See M.P.E.P. § 707.07(f).

Applicants further note that the arguments presented at page 13, line 22-page 14, line 3 of Applicants' previous response (traversing the rejection of claim 12) were not answered, let alone addressed. If the current rejection of claim 12 is to be maintained, Applicants respectfully request the substance of this argument be answered. Otherwise, Applicants request withdrawal of the current rejection of claim 12. See M.P.E.P. § 707.07(f).

Applicants further note that the arguments presented at page 14, lines 8-21 of Applicants' previous response (traversing the rejection of claim 16) were not answered, let alone addressed.

If the current rejection of claim 16 is to be maintained, Applicants respectfully request the substance of this argument be addressed and answered. Otherwise, Applicants request withdrawal of the current rejection of claim 16. See M.P.E.P. § 707.07(f).

Claim 27 recites elements similar to those recited in claims 19, 12 and 13. Accordingly, arguments presented above with respect to the rejection of claims 19, 12 and 13 are similarly applicable with respect to the rejection of claim 27.

Claims 21-26, 32-37 and 41 depend from claim 27 and, therefore, include each and every element recited in claim 27. Accordingly, Applicants respectfully submit that the combination of Horie in view of Tomoyasu fails to render claims 21-26, 32-37 and 41 obvious for at least the reasons presented above with respect to the rejection of claim 27.

Further, claim 34 recites elements similar to those recited in claim 16. Accordingly, arguments presented above with respect to the rejection of claim 16 are similarly applicable with respect to the rejection of claim 34.

Further, claim 37 recites elements similar to those recited in claim 19. Accordingly, arguments presented above with respect to the rejection of claim 37 are similarly applicable with respect to the rejection of claim 19.

Claims 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horie in view of Tomoyasu, and further in view of U.S. Patent No. 4,534,816 issued to Chen et al. (hereinafter “Chen”). Applicants respectfully traverse this rejection.

Claims 42 and 43 depend from claims 19 and 37, respectively and therefore include all of the elements recited in claims 19 and 37, respectively. As shown above, the combination of Horie in view of Tomoyasu fails to render claims 19 and 37 obvious. Chen does not add any teaching which cures the deficiency of Horie in view of Tomoyasu. Accordingly, the combination of Horie in view of Tomoyasu and Chen fails to render claims 42 and 43 obvious at least by virtue of their respective dependencies from claims 19 and 37.

Further rejecting claims 42 and 43, the Office Action asserts that it would have been obvious to “[add] an additional cooling plate to the apparatus of Tomoyasu,” outside the process chamber (502; Figure 18) of Tomoyasu, to “[increase] temperature control.” Applicants respectfully disagree.

As acknowledged in the both the previous and current Office Actions, Tomoyasu teaches “a cooling system (521; Figure 18) configured to cool a bottom surface of the process chamber (502; Figure 18).” Tomoyasu is completely silent as to any teaching or suggestion supporting a determination that adding an additional cooling plate to the apparatus of Tomoyasu, outside the process chamber (502; Figure 18) of Tomoyasu, would increase “temperature control.”

Moreover, the Office Action identifies no basis in fact or technical reasoning which reasonably supports a determination that “temperature control” would be increased simply by adding an additional cooling plate outside the process chamber (502; Figure 18) of Tomoyasu. Further, the Office Action identifies no knowledge within the level of ordinary skill in the art indicating that one of ordinary skill, seeking to “increase temperature control” in Tomoyasu, would do so simply by adding an additional cooling plate outside the process chamber (502; Figure 18) of Tomoyasu.

In view of the above, the Office Action fails to articulate a finding that there is any teaching, suggestion, or motivation, either in Tomoyasu or in the knowledge generally available to one of ordinary skill in the art, to modify the apparatus of Tomoyasu by adding an additional cooling plate outside the process chamber (502; Figure 18) to “increase temperature control.” Accordingly, the Office Action fails to establish one of ordinary skill in the art would have found is “obvious” to modify the combination of Horie in view of Tomoyasu using Chen as proposed in the Office Action.

CONCLUSION

For the foregoing reasons, reconsideration and allowance of the pending claims of the application as amended is requested. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

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